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Canadian Atlantic Fisheries
Scientific Advisory Committee

CAFSAC Research Document 88/33

Comité scientifique consultatif des
pêches canadiennes dans d'Atlantique

CSCPCA Document de recherche 88/33

Movement of lobsters (*Homarus americanus*) in St. George's Bay effect on the standing stock

by

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ABSTRACT

Nineteen hundred and sixty eight lobsters (Homarus americanus) were tagged with sphyrion tags on two sites, one inside and the other at the entrance of St. George's Bay, Nova Scotia, 290 (14.7%) were recovered after one year at liberty. In summary, 94.5% of those originally released inside the bay and 81.7% of those originally released at the bay entrance remained in or entered the bay over one year. All movement of the tagged lobsters was restricted to western St. George's Bay.

RESUME

Des 1968 homards (Homarus americanus) étiquettés avec des étiquettes de type sphyrion à deux sites, un à l'intérieur de la baie et l'autre à l'entrée de la baie St-George, Nouvelle-Ecosse, 290 (14.7%) ont été recapturés après un an de liberté. En résumé, 94.5% de ceux originalement relâchés à l'intérieur de la baie ont resté dans la baie ou ont entré dans la baie après un an, leur mouvement étant restreint dans la partie ouest de la Baie St-George.

INTRODUCTION

Movement of lobsters (Homarus americanus), in the Gulf of St. Lawrence, has been studied by marking of lobsters over the last forty years. Recently, sphyrion tagging projects in the southern Gulf (Wilder 1963, Robinson per. comm., Jamieson and Campbell 1985, Maynard and Chiasson 1986a, b) have attempted to answer specific questions concerning lobster movement, growth, and mortality (fishing and natural). These studies indicate that specific areas appear to have certain movement patterns which could be governed by a variety of factors (hydrography, physical environment, and lobster physiology) which can vary from area to area.

In 1985 fishermen in the St. George's Bay area expressed their concern to the Department of Fisheries and Oceans (DFO) that the lobster landings in their area had declined, and requested that DFO investigate if a net lobster movement to a region outside of the bay may have caused this decline in the fishery. In 1986, the Invertebrates Research Group undertook a tagging study in the Ballantyne's Cove, Cape George area of St. George's Bay to determine the overall movement of lobsters in this area. This report summarize the results of a tag recovery study for the first year after release, and examines the pattern of movement from these recoveries in reference to the question of net lobster movement out of St. George's Bay.

MATERIALS AND METHODS

The results of a diving survey conducted by the authors at the end of the 1985 lobster fishing season in the St. George's Bay area indicated that, at that time of the season, lobster density differed from the bay entrance area of Cape St. George to the inner bay area of Ballantyne's Cove (unpublished data). These observations lead the authors to use two tagged lobster release locations, which would identify differences, if any, in lobster movement in relation to proximity of the bay entrance. If net lobster movement out of one area and into the adjacent area did exist, it may be the cause for the differences in the observed lobster densities.

Lobsters were tagged and released at two locations Fig. (1) (892 females and 304 males) at site 1 inside St. George's Bay, at Ballantyne's Cove, and (518 females and 254 males) at site 2 at the entrance of the Bay at Cape George. Modified sphyrion tags (Scarratt and Elson 1965, Maynard and Chiasson 1986a, b) were used to tag 1968 trap caught lobsters of carapace lengths ranging from 52 to 135mm, during the period of July 4th to July 15th, 1986.

The following year, during the commercial lobster fishing season (May 1st, to June 30th, 1987) local observers purchased the tagged lobsters and obtained the recapture location. The results were then tabulated and plotted for each release area as reported in previous tagging studies by Maynard and Chiasson (1986a, b).

RESULTS

Of the 1196 tagged lobsters released at site 1, 164 were recovered (119 females and 45 males); of these, 9 individuals or 5.4% were found outside the St. George's Bay (Fig. 2). Of the 772 tagged lobsters released at site 2, 126 were recovered (86 females and 40 males); of these, 23 (18.2%) were found outside of St. George's Bay, (Fig. 3).

The mean distance moved for recaptured lobsters that left the bay was 35.6 km and 31.8 km for sites 1 and 2 respectively. The mean distance moved for lobsters that remained in the bay was 5.1 km and 7.9 km for site 1 and 2 respectively.

DISCUSSION

The general pattern of lobster movement in St. George's Bay, Fig. 2, 3 appears to be less than 20.0 km, but a small percentage of the lobsters recovered moved up to and greater than 50.0 km. These results support those of earlier tagging studies by Maynard and Chiasson (1986a, b) and others (Stasko 1980) in the Gulf of St. Lawrence.

The general preliminary results of this tagging project indicate that the majority of lobsters (94.51%), with a carapace length of 58.0 mm and greater, released within St. George's Bay, appear to have movement restricted to the bay itself. We have also shown that lobsters tagged and released just outside of the bay have a tendency (81.71%) to enter the bay. It appears that St. George's Bay adult lobster stock prefers to remain in the bay itself. These findings concur with those of Harding et al. (1982), who concluded after extensive research on the lobster larval populations of St. George's Bay, that the bay had a self contained lobster recruitment system governed by the prevailing wind driven surface drift and the adult population of the bay.

It has been shown in previous tagging studies conducted in Northumberland Strait that all the tagged lobsters are not recovered the first year after release, (Stasko 1980, Maynard and Chiasson 1986a, b). Therefore, we could expect up to 5% of the total number of lobsters tagged to be recovered over the next several years, this additional data may alter the conclusions reached below.

In conclusion, unless there was an adverse environmental occurence that would cause the lobsters to change their pattern of movement, the majority of lobsters within and in the proximity of St. George's Bay appear to have movement restricted to the bay itself.

ACKNOWLEDGEMENTS

We wish to thank all those who assisted in the recovery of the lobster tags and information and Gerard Conan for comments. This paper was reviewed by Kevin Davidson and Tom Sephton.

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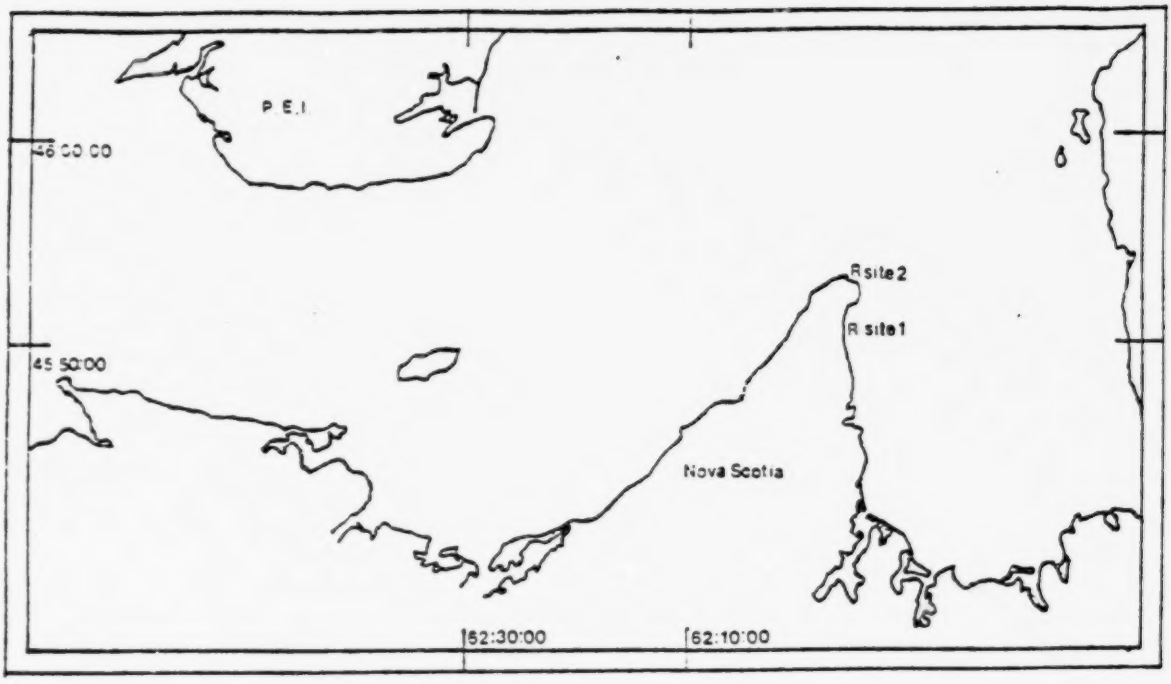

Figure 1. Location of lobster tag and release sites 1 and 2 in the St. George's Bay area.

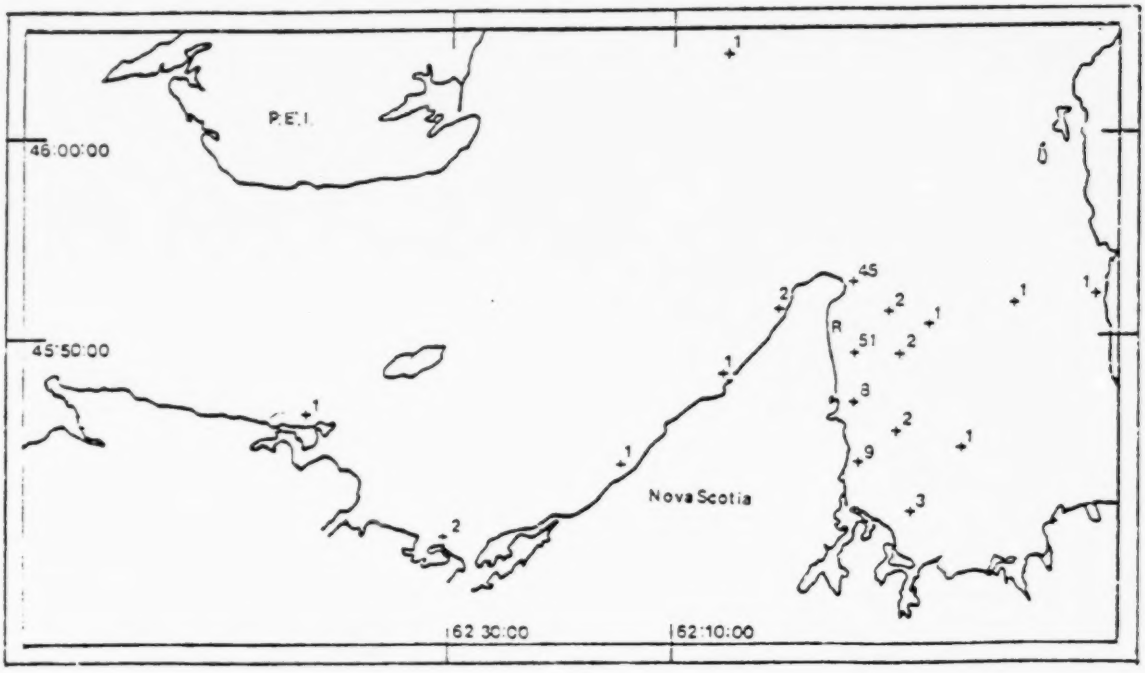

Figure 2. Map of St. George's Bay area showing the recovery sites, number represents the number of lobster recovered in a 2 square nautical mile area. Each of the lobsters released at site 1. (Not shown on the map is a lobster recovered at East Point P.E.I.)

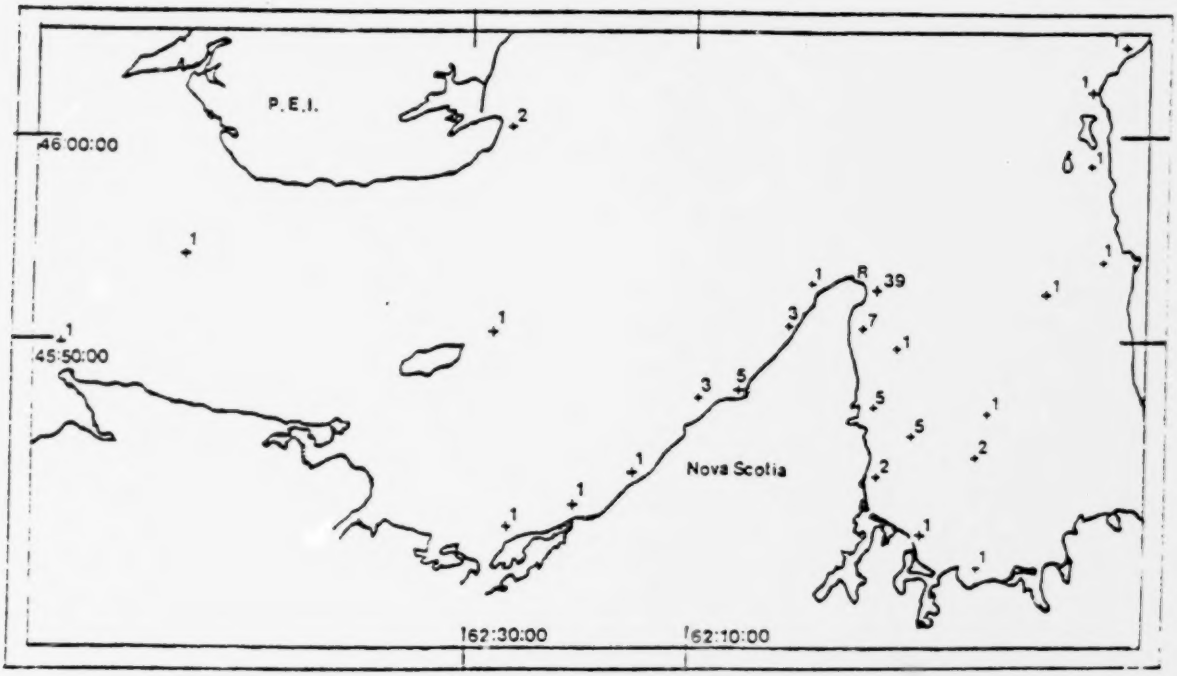

Figure 3. Map of St. George's Bay area showing the recovery sites, number represents the number of lobster recovered in a 2 square nautical mile area. Each of the lobsters released at site 2. (Not shown on the map is a lobster recovered at East Point P.E.I.)